

**REMARKS**

Entry of the foregoing amendments is respectfully requested.

**Summary of Amendments**

Upon entry of the foregoing amendments, claims 21-50 are cancelled and claims 51-80 are added, whereby claims 51-80 will be pending, with claims 51 and 74 being independent claims.

Support for the new claims can be found throughout the present specification and in the cancelled claims.

Applicants emphasize that the cancellation of claims 21-50 is without prejudice or disclaimer, and Applicants expressly reserve the right to prosecute the cancelled claims in one or more continuation and/or divisional applications.

**Summary of Office Action**

As an initial matter, Applicants note with appreciation that the Office Action indicates that the claim for priority is acknowledged and that a certified copy of the priority document has been received by the Patent and Trademark Office from the International Bureau.

Applicants also note with appreciation that the Examiner has indicated consideration of the Information Disclosure Statement filed February 2, 2007.

The restriction requirement is made final and claims 35-50 are withdrawn from consideration.

Claims 21, 22, 24, 30, 31, 33 and 34 are rejected under 35 U.S.C. § 102(b) as allegedly being

anticipated by Floch et al., U.S. Patent No. 5,858,526 (hereafter "FLOCH").

Claims 21-28, 30, 31, 33 and 34 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mennig et al., U.S. Patent No. 6,455,103 (hereafter "MENNIG"), in view of Edwards, U.S. Patent No. 3,493,289 (hereafter "EDWARDS").

Claims 29 and 32 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of Forrest et al., U.S. Patent No. 6,091,195 (hereafter "FORREST").

#### **Response to Office Action**

Reconsideration and withdrawal of the objection and rejections of record are respectfully requested, in view of the foregoing amendments and the following remarks.

#### ***Response to Rejection under 35 U.S.C. § 102(b)***

Claims 21, 22, 24, 30, 31, 33 and 34 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by FLOCH. The rejection essentially asserts that FLOCH discloses all of the elements in the recited claims either explicitly or inherently.

Applicants respectfully traverse this rejection. In particular, it is pointed out that the instant independent claims recite, *inter alia*, a single-stage thermal consolidation of the organically crosslinked layer(s) and a burnout of organic constituents in step (g) or (d), respectively. Applicants note that in this regard, the Examiner takes the position that this element "is a method limitation and

does not determine the patentability of the product” (see comments at page 4, first paragraph of the instant Office Action). Applicants respectfully disagree with the Examiner in this regard.

Specifically, “burnout of organic constituents” makes it clear that the applied temperatures must be sufficiently high to remove organic components by thermal decomposition and removal in the form of gaseous products.

It is not seen that in the process disclosed by FLOCH any temperatures which can reasonably be assumed to result in a burnout of organic constituents are applied. On the contrary, the highest temperatures mentioned in FLOCH appear to be those mentioned in, e.g., col. 10, lines 7-10 and 34-38 thereof, i.e., about 110° to 120° C (see also col. 12, lines 59-63 and col. 16, lines 55-62 of FLOCH). These temperatures will clearly not result in a burnout of organic matter. This is confirmed by the fact that these temperatures are used “to establish the siloxane bridges and organic bridges between the adhesion promoting coatings ... and the adjacent coatings” and “to complete the coupling and evaporate the residual solvent”.

This also is consistent with the disclosure in the present specification and claims. For example, according to instant claim 70 one or more organically crosslinked layers are formed at a temperature of up to about 130°C. In contrast, instant claim 71, for example, recites that “(g) is carried out at a temperature of at least 400°C”, i.e., at a temperature which is significantly higher than the temperatures which are usually used and required for the polymerization of organic compounds and which can reasonably be assumed to result in thermal decomposition of organic constituents and evaporation of decomposition products.

To sum up, the product of FLOCH differs from the claimed substrate at least in that the former comprises (significant amounts) of organic matter, whereas organic constituents have been removed from the claimed substrate by a thermal treatment.

Applicants submit that for at least all of the foregoing reasons, FLOCH is unable to anticipate the subject matter of any of the claims submitted herewith, wherefore withdrawal of the rejection under 35 U.S.C. § 102(b) over FLOCH is warranted, which action is respectfully requested.

***Response to Rejections under 35 U.S.C. § 103(a)***

Claims 21-28, 30, 31, 33 and 34 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and claims 29 and 32 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of FORREST. The rejection essentially alleges that MENNIG discloses or renders obvious the elements of the claimed substrate with the exception that MENNIG fails to disclose a crystalline transparent substrate, such as quartz, and also fails to disclose a transparent sheet of sapphire. In this regard, the Examiner takes the position that EDWARDS and FORREST cure the noted deficiencies of MENNIG.

Applicants respectfully traverse this rejection as well. In particular, it is noted that present independent claim 51 recites, *inter alia*, that for the uppermost layer the nanoscale inorganic solid particles do not comprise a polymerizable or polycondensable organic group so that for the uppermost layer a polymerization or polycondensation of groups of the solid particles with

formation of organic crosslinking does not take place before or during (g). It is not seen that MENNIG teaches or suggests that the inorganic multilayered optical systems taught therein may comprise a layer which is not polymerized. On the contrary, in col. 2, lines 16-24 thereof MENNIG teaches (emphasis added):

The use of nanoscale particles coated with polymerizable and/or polycondensable groups gives rise to the possibility of producing chemically stable layers even at very low temperatures, for example via photopolymerization, and in this way applying further layers by the same method. It has been found here, entirely surprisingly, that these layers can be densified without cracking, even in the case of layer systems having up to 10 or more individual layers, and that their optical effect can be calculated accurately in advance.

In other words, MENNIG makes it clear that the presence of nanoscale particles coated with polymerizable and/or polycondensable groups is necessary in order to be able to densify the corresponding layers without cracking, thereby teaching away from the use of any layers which contain nanoscale inorganic solid particles without polymerizable and/or polycondensable organic groups. For this reason alone, MENNIG fails to render obvious the subject matter of any of the instant claims. EDWARDS and FORREST are apparently unable to cure the noted deficiency of MENNIG.

In this regard it further is noted that EDWARDS does not teach or suggest that a crystalline substrate may be used as a substrate for a system comprising linked nanoparticles. For example, according to col. 2, lines 16-21, the primary object of the invention disclosed therein is to provide a compound having a high refractive index and which is capable of being applied as a thin film by the thermal evaporation process at relatively low temperatures.

Further, the substrate mentioned in col. 4, lines 35-39 of FORREST is used as a part of a light emitting system. In view thereof, the substrate has to be transparent in order to allow light to

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pass therethrough. This is the only property that the materials mentioned in FORREST have to have in common. There is no teaching or suggestion in FORREST that these materials are also usable for an optical system according to the present invention (see, for example, instant claims 67 and 68).

Because the facts set forth above are clear, Applicants refrain from commenting on the remaining allegations which are set forth in the instant Office Action without admitting, however, that any of these allegations is meritorious.

Applicants submit that for at least all of the foregoing reasons, the instant rejections under 35 U.S.C. § 103(a) are unwarranted, wherefore withdrawal thereof is respectfully requested as well.

### CONCLUSION

In view of the foregoing, it is believed that all of the claims in this application are in condition for allowance, which action is respectfully requested. If any issues yet remain which can be resolved by a telephone conference, the Examiner is respectfully invited to contact the undersigned at the telephone number below.

Respectfully submitted,  
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/Heribert F. Muensterer/  
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